

CLAIMS

What is claimed is:

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1. A method for shrinking the image of photoresist, the method comprising:

providing a substrate;

forming a photoresist layer on said substrate;

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exposing said photoresist layer to form a first photoresist region and a second photoresist region;

15 forming a chemical diffusion layer on said first photoresist region and said second photoresist region;

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baking said chemical diffusion layer, said first photoresist region and said second photoresist region; and

developing said chemical diffusion layer, said first photoresist region and said second photoresist region.

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2. The method according to claim 1, wherein said second photoresist region includes a first chemical material.

3. The method according to claim 2, wherein said first chemical material is an acid-based material.

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4. The method according to claim 2, wherein said first chemical material comprises a fluorine-base acid.

5. The method according to claim 2, wherein said chemical diffusion layer including a second chemical material.

5 6. The method according to claim 5, wherein said first chemical material and said second chemical material is the same.

10 7. The method according to claim 5, wherein said first chemical material of said second photoresist region and said second chemical material of said chemical diffusion layer is diffused into said first photoresist region to react with the material of said first photoresist region for forming a chemical reaction layer within said first photoresist region in said baking process.

15 8. The method according to claim 7, wherein said first photoresist region shrinks in line width in said developing process.

9. The method according to claim 8, wherein said shrinking line width of said first photoresist region depends on a diffusive rate of said first chemical material.

20 10. The method according to claim 9, wherein said shrinking line width of said first photoresist region is controlled by the time for baking.

25 11. The method according to claim 10, wherein said baking process lasts about 10 seconds to 600 seconds.

12. The method according to claim 9, wherein said shrinking line width of said first photoresist region is controlled by temperature.

5 13. The method according to claim 12, wherein the temperature in said baking process lasts about 50 degrees centigrade to 200 degrees centigrade.

10 14. A method for shrinking the image of photoresist, the method comprising:

15 providing a substrate; F
 forming a photoresist layer on said substrate; F
 forming a chemical diffusion layer on said photoresist layer;
 exposing said photoresist layer to form a first photoresist region and a second photoresist region;

20 baking said chemical diffusion layer, said first photoresist region and said second photoresist region; and

25 developing said chemical diffusion layer, said first photoresist region and said second photoresist region.

15. The method according to claim 14, wherein said chemical diffusion layer is transparent.

20. The method according to claim 14, wherein said second photoresist region includes a first chemical material.

25 17. The method according to claim 16, wherein said chemical diffusion layer including a second chemical material.

18. The method according to claim 17, wherein said first chemical material of said second photoresist region and said second chemical material of said chemical diffusion layer is diffused into said first photoresist region to react with the material of said first photoresist region for forming a chemical reaction layer within said first photoresist region in said baking process.

19. The method according to claim 18, wherein said first photoresist region shrinks in line width in said developing process.

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20. The method according to claim 19, wherein said shrinking line width of said first photoresist region depends on a diffusive rate of said first chemical material.